

REMARKS

The listing of claims provided herein reflects Applicants' understanding that the amendments filed with the "Amendment or Response After Final Rejection" filed on September 21, 2004 were entered upon filing of the Notice of Appeal in this application on November 22, 2004. This understanding is based on the Advisory Action dated October 28, 2004 ("Advisory Action"), which indicated that the earlier amendments would be entered.

Claims 10-22 are pending in the application. Claims 18 and 22 have been amended to correct obvious typographical errors. No new matter has been added.

The Invention

The present invention provides optical data recording medium which are resistant to deformation (e.g., warp) due to changes in temperature. More particularly, the present invention provides optical data recording media in which the expansion coefficient of the protective film and the transparent substrate are regulated to prevent a bending force that can induce a warp or bend in the medium. The present inventors have surprisingly discovered that selecting the materials used in the protective layer and the transparent substrate provides superior thermal stability and reduced medium deformation.

The Office Action and Advisory Action

Applicants note with appreciation the indication, in the Advisory Action, that the claims are fully compliant with the requirements of 35 U.S.C. §112, including the written description requirement of §112, first paragraph.

Claims 10-16 were rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Murakami (U.S. Patent 5,452,272).

The rejection is traversed.

As the document is understood, Murakami teaches an optical recording medium which uses a polyurethane acrylate resin overcoating. Murakami, et al. does not describe the expansion properties of any layer of the recited overcoating and more particularly does not teach or suggest controlling the warp or tilt of the optical recording media by modulating the linear expansion coefficient of one or more of the layers constituting the optical recording media.

The Murakami reference, whether considered alone or in combination with other cited references, does not teach or suggest preventing thermally induced deformation or warping of an optical media comprising a transparent substrate, a thin film layer formed on the transparent substrate and a protective film by regulating the linear expansion coefficient of the transparent substrate and the protective layer as specified in claims 10 and 14. More particularly, none of the cited documents, including Murakami, teach or suggest preventing thermal deformation of an optical recording media by selecting the transparent substrate and the protective layer such that the linear expansion coefficient of the protective film is greater than 9.5×10^{-5} ($1/^{\circ}\text{C}$) and smaller than 5.0×10^{-4} ($1/^{\circ}\text{C}$) and that the protective layer has a larger linear expansion coefficient than the transparent substrate.

As noted above, Murakami generically discloses an optical recording media having a polyurethane-acrylate overcoating, but fails to teach or suggest using resins having specified linear expansion coefficient to prevent media deformation. More particularly, Murakami fails to teach or suggest that dimensionally stable optical recording media can be fabricated by controlling the ratio and magnitude of the linear expansion coefficient of the protective layer and the transparent substrate as recited in claims 10, 14 and 18.

In the Office Action, the Examiner states that:

the THERMAL linear expansion coefficient is a property inherent to the material and notes that the applicant describes on page 11, urethane, epoxy, polyester and polyether acrylates as useful and meeting the material limitations for the protective layer [citation omitted]. The applicant argues as if the inherent property needed to be specifically set forth in the reference applied. This is not the case if the property is reasonably [sic] to be inherent. The Examiner notes that the THERMAL linear expansion coefficient is a property inherent to a material, based upon its composition and notes that the polyurethane-acrylate UV curable resin is one of those mentioned by the applicant as useful. Therefore the examiner asserts that the property is inherent and the claim anticipated.

Office Action at section 6 (emphasis in original).

The Examiner appears to take the position that all urethane, epoxy, polyester and polyether acrylates which can be used in optical recording media inherently possess linear expansion coefficient values specified in the pending claims of the instant application. Moreover, the Office Action appears to aver that because warping or tilting in the optical recording media is bad, that any prior art optical recording media which is designed to prevent warp or tilt caused by any stimulus automatically must also satisfy the claim limitations of the instant application.

Applicants do agree that the thermal linear expansion coefficient is an inherent property of a material. However, as Applicants have pointed out previously, a mere assertion that a property is inherent is insufficient to prove that a reference is anticipatory. Although Applicants agree that certain urethane, epoxy, polyester or polyether acrylate materials are useful in the present invention, the pending claims further require that each material used in the protective layer or the transparent substrate possess specified linear expansion coefficient values. Thus, the instant invention contemplates fabrication of the transparent substrate and protective layer from materials such as urethane, epoxy, polyester or polyether acrylate materials (or polyolefin or polycarbonate) which possess the requisite linear expansion coefficient specified (e.g., as specified in claims 10 and 14). While the Examiner states that "urethane, epoxy, polyester and polyether acrylates are disclosed as useful and meeting the material limitation for the protective layer," Applicants contend that the instant specification does not suggest that all polyester,

epoxy, urethane or polyether acrylates are useful in the present invention. Rather, the present specification teaches that those materials meeting *specified limitations* of linear expansion coefficient (and in certain claimed embodiments, Young's modulus) are useful in the claimed invention.

The claimed invention provides that the material of the protective layer has a linear expansion coefficient value greater than that of the transparent substrate and that the linear expansion coefficient of the protective layer is between 9.5×10^{-5} and 5.0×10^{-4} ($1/^\circ\text{C}$). As disclosed by the present specification, optical data recording media which satisfy the above requirements are particularly resistant to deformation or warpage caused by changes in temperature.

It is well-established that a claim is anticipated only if each and every element or feature of a claim is expressly or inherently described in a single prior art reference. See, e.g., MPEP 2131. In the present case, the Examiner appears to agree that the Murakami reference does not expressly disclose all the elements of the presently-claimed invention. For a reference to inherently disclose a feature not expressly disclosed, extrinsic evidence can be used to supply the missing feature only if the extrinsic evidence "make[s] clear that the missing descriptive matter is *necessarily present* in the thing described in the reference and that it would be so recognized by persons of ordinary skill in the art. Inherency, however, may not be established by probabilities or possibilities." MPEP 2112(IV), citing *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999) (citations omitted) (emphasis added).

However, the Office Action has not provided any *extrinsic* evidence that the optical recording media of Murakami disclose *all the features* of the claimed invention, or that persons of ordinary skill in the art would recognize that *all the features* of the claimed invention are present in the Murakami reference. See, e.g., MPEP §2131.01, Heading III citing *Continental Can Co. USA v. Monsanto Co.* 20 USPQ2d 1746 (Fed. Cir. 1991).

Murakami neither discloses nor suggests imposing such a performance requirement on the materials used for the optical recording medium recited therein. Moreover, no extrinsic evidence has been presented to show or establish that the protective layers or transparent substrates of the optical recording media of Murakami necessarily possess the linear expansion coefficients recited in claims 10 and 14, as currently amended.

Applicants respectfully submit that the materials disclosed in the Murakami reference do not necessarily possess the properties of the claimed invention. Materials described in similar general terms can and often do have quite different properties, including different linear expansion coefficients. For example, as shown on the attached Table (Exhibit A), materials generically termed “acrylic UV curable resins” having similar principal components can nevertheless have a range of linear expansion coefficients (in the Table, ranging from about 1.10×10^{-5} to about 1.46×10^{-4} (1/°C) (note that the acrylic ester commercial product listed at the bottom of the Table does not have a linear expansion coefficient within the range required by the instant claims). It is clear that a reference disclosing an acrylic UV curable resin would not necessarily provide a disclosure of an acrylic UV curable resin having a linear expansion coefficient *in a specific range*. So it is with the Murakami reference, which at the portion cited by the Examiner (Column 8, lines 47-49), states that an “overcoat film” can be an “ultraviolet hardening resin from polyurethane acrylate series.” This disclosure does not expressly nor inherently describe a protective film having a linear expansion coefficient of the greater than 9.5×10^{-5} (1/°C) and smaller than 5.0×10^{-4} (1/°C), as required by the pending claims. Therefore, the Murakami reference does not and cannot anticipate the pending claims.

For at least the reasons discussed herein, claims 10, 14, and 18 are patentable over the Murakami patent (Applicants note that claims 17-22 were not rejected under 35 U.S.C. §102(b) over Murakami). Claims 11-13, 15-17, and 19-22 depend from claims 10, 14 or 18 and are therefore also patentable over the Murakami patent.

Claims 10-16 were rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Inuoue (U.S. Patent 4,590,493). The Examiner cites the Inuoue reference as teaching “urethane acrylates” as useful for forming protective coatings. The Examiner further states that “[u]rethane, epoxy, polyester and polyether acrylates are disclosed as useful and meeting the material limitation of the claims in the instant specification at page 11, lines 1-6.” This rejection is traversed.

The arguments present above with respect to the Murakami reference apply *mutatis mutandis* to the Inuoue reference. The Inuoue reference does not expressly disclose any linear expansion coefficient for the protective coatings therein, and there is no teaching that the materials necessarily possess all the properties recited in the pending claims. The Examiner has provided no extrinsic evidence showing that the protective coating materials of Inuoue necessarily possess the claimed characteristics.

Applicants respectfully contend that the Inuoue reference does not and cannot anticipate the pending claims.

Claims 10-16 were rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Ohta (U.S. Patent 5,453,884). The Examiner cites the Ohta reference as teaching a “UV-cured urethane-acrylate” as a coating. This rejection is traversed.

The arguments present above with respect to the Murakami reference apply *mutatis mutandis* to the Ohta reference. The Ohta reference does not expressly disclose any linear expansion coefficient for the protective coatings therein, and there is no teaching that the materials necessarily possess all the properties recited in the pending claims. The Examiner has provided no extrinsic evidence showing that the protective coating materials of Ohta necessarily possess the claimed characteristics. Applicants respectfully contend that the Ohta reference does not and cannot anticipate the pending claims.

Claims 10-16 were rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Yokoyama (U.S. Patent 5,714,222). The Examiner states that Yokoyama teaches a “UV cured urethane-acrylate” or “epoxy-acrylate” as a coating. This rejection is traversed.

The arguments present above with respect to the Murakami reference apply *mutatis mutandis* to the Yokoyama reference. The Yokoyama reference does not expressly disclose any linear expansion coefficient for the protective coatings therein, and there is no teaching that the materials necessarily possess all the properties recited in the pending claims. The Examiner has provided no extrinsic evidence showing that the protective coating materials of Yokoyama necessarily possess the claimed characteristics. Applicants respectfully contend that the Yokoyama reference does not and cannot anticipate the pending claims.

Claims 10-16 were rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Yoshioka (U.S. Patent 5,674,649). The Examiner states that Yoshioka teaches a “UV cured urethane-acrylate” as a coating. This rejection is traversed.

The arguments present above with respect to the Murakami reference apply *mutatis mutandis* to the Yoshioka reference. The Yoshioka reference does not expressly disclose any linear expansion coefficient for the protective coatings therein, and there is no teaching that the materials necessarily possess all the properties recited in the pending claims. The Examiner has provided no extrinsic evidence showing that the protective coating materials of Yoshioka necessarily possess the claimed characteristics. Applicants respectfully contend that the Yoshioka reference does not and cannot anticipate the pending claims.

Claims 1-4 and 6 were rejected under 35 U.S.C. §102(b) as being allegedly anticipated by Tachibana (U.S. Patent 5,102,709). The Examiner states that Tachibana teaches a “UV cured urethane-acrylate” as a coating. This rejection is traversed. Applicants note that claims 1-4 and 6 are canceled. However, if the Examiner intended to apply the Tachibana reference to the pending claims, Applicants submit the following remarks.

The arguments present above with respect to the Murakami reference apply *mutatis mutandis* to the Tachibana reference. The Tachibana reference does not expressly disclose any linear expansion coefficient for the protective coatings therein, and there is no teaching that the materials necessarily possess all the properties recited in the pending claims. The Examiner has provided no extrinsic evidence showing that the protective coating materials of Tachibana necessarily possess the claimed characteristics. Applicants respectfully contend that the Tachibana reference does not and cannot anticipate the pending claims.

Claims 10-22 were rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Murakami or Tachibana. Tachibana. This rejection is traversed.

As the MPEP states, “there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.” See, e.g., MPEP 2143.

The teachings and deficiencies of the Murakami reference and the Tachibana reference have been described above. None of the cited references, alone or in combination, teach or suggest preventing thermally induced deformation or warping of an optical media comprising a transparent substrate, a thin film layer formed on the transparent substrate and a protective film by regulating the linear expansion coefficient of the transparent substrate and the protective layer as specified in claim 10. More particularly, none of the cited documents teach or suggest preventing thermal deformation of an optical recording media by selecting the transparent substrate and the protective layer such that the linear expansion coefficient of the protective film is greater than 9.5×10^{-5} ($1/^{\circ}\text{C}$) and smaller than 5.0×10^{-4} ($1/^{\circ}\text{C}$) and that the protective layer has a larger linear expansion coefficient than the transparent substrate. Applicants have surprisingly discovered that selecting the materials used in the protective layer and the transparent substrate provide superior thermal stability and reduced medium deformation.

None of the references relied upon by the Examiner teach or suggest an optical data recording medium which possesses an linear expansion coefficient of the protective film is greater than that of the transparent substrate and is between 9.5×10^{-5} and 5.0×10^{-4} ($1/^{\circ}\text{C}$). Furthermore, none of the cited documents, taken alone or in combination, teach or suggest optical recording media in which the linear expansion coefficient of the protective film is greater than that of the transparent substrate. Because the cited references do not expressly or inherent disclose optical recording media having all the elements of the pending claims, and do not teach or suggest that it would be beneficial to prevent thermal deformation of an optical recording media by selecting the transparent substrate and the protective layer such that the linear expansion coefficient of the protective film is greater than 9.5×10^{-5} ($1/^{\circ}\text{C}$) and smaller than 5.0×10^{-4} ($1/^{\circ}\text{C}$), and that the protective layer has a larger linear expansion coefficient than the transparent substrate, the references, whether taken alone or in combination, cannot render obvious the claimed invention.

With respect to claims 18-22, which were not rejected under 35 U.S.C. §102(b) over either the Murakami or Tachibana reference, Applicants additionally submit that neither cited reference can render obvious the claimed invention. Claim 18 (and claims 19-22 which depend therefrom) is directed to a *method of selecting* a protective film in an optical data recording medium, wherein the optical data recording medium comprises a transparent substrate, a thin film layer formed on the transparent substrate and a protective film which is mainly comprised of a resin and formed on the thin film layer for protecting the thin film layer, and wherein the transparent substrate and the thin film layer have selected properties; in particular, the linear expansion coefficient of the protective film is greater than 9.5×10^{-5} ($1/^{\circ}\text{C}$) and smaller than 5.0×10^{-4} ($1/^{\circ}\text{C}$).

As noted above, neither of the cited references teaches a protective film having the claimed properties, and neither reference suggests the desirability of selecting materials having such properties. The references are simply silent as to the selection of properties according to the claims. Applicants respectfully submit that the cited references do not

contain any suggestion of a method of *selecting* a protective film according to claim 18 (and the claims dependent therefrom), nor would they provide any motivation for the skilled artisan to modify the reference teachings so as to arrive at the claimed invention. Therefore, the references cannot render obvious the claimed invention.

For at least the above reasons, reconsideration and withdrawal of the rejections is proper and the same is requested.

Reconsideration and allowance of claims 10-22 is respectfully requested in view of the foregoing discussion.

Conclusion

This case is believed to be in condition for immediate allowance. Applicant respectfully requests early consideration and allowance of the subject application.

If for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge Deposit Account No. **04-1105**.

Should the Examiner wish to discuss any of the amendments and/or remarks made herein, the undersigned would appreciate the opportunity to do so.

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Respectfully submitted,



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Separate Sheet A



Acrylic UV Curable Resin		Liner Expansion
Acrylic UV Curable Resin	Principal Components	Coefficient of Protective Film (1/K)
A	Mixture of Acrylate Oligomer (Acrylic Ester), Acrylate Monomer, and Photopolymerization Initiator	9.70E-05
B		1.17E-04
C		1.15E-04
D		1.10E-04
E		1.12E-04
F		1.17E-04
G		1.13E-04
H		1.10E-04
I		1.15E-04
J		6.38E-05
K		8.60E-05
L		1.10E-05
M		1.46E-04
Commercial Acrylic UV Curable Resin	Acrylic Ester Compound	6.01E-05

Note: Acrylic UV curable resins A-M are not commercial products, but are test products whose names are not given.